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Embodiment and Persuasion. The communicative power of metaphors

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Abstract Persuasion, the ability to linguistically affect other people attitudes and beliefs, has a crucial role in our life, from everyday choices to political orientations. For this reason, understanding its mechanisms is one of the most burning questions for modern societies. Metaphors have always had a special role in research on persuasion, being considered powerful persuasive devices. However, so far, divergent findings have been obtained. As a consequence, the mechanisms and extent of the persuasiveness of metaphors are still partly unknown. The specific role of metaphors in persuasion will be addressed here using a novel approach developed across philosophy, social psychology and neuroscience and through the combination of findings from all these disciplines. On the basis of data from all these different fields, it will be presented and discussed the hypothesis that persuasion can partly rely on the recruitment of bodily experiences and that metaphors are particularly suited to exploiting them. The processing of bodily metaphors (namely, metaphors such as "to see an idea" or "to grasp a concept", based on bodily experiences) determines the activation of our sensory and motor systems. It will be hypothesized that bodily-based metaphors increase persuasive effects and that their effectiveness relies exactly on the recruitment of the sensory and motor systems.

Keywords: Metaphors, persuasion, embodied simulation, embodied persuasion, transportation theory

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0. Introduction

In 2014 European citizens have been asked to vote for the election of the European parliament. In Italy, the Democratic Party, run by the young prime minister Matteo Renzi, won the election with more than 40% of the votes. The success of the Democrats, after twenty years in which Silvio Berlusconi had held centre stage in the Italian political scene, seems to be a personal victory of Renzi. And it is evident to many that one of the keys of this success was the communicative ability of the prime minister. Sometime later, during a television debate, Renzi revealed the secret of his success. 'To be a leader', he said, 'it's necessary to be able to create metaphors'. And, indeed, Renzi creates a lot of metaphors, every day and in every occasion, and most of them are based on actions and bodily experiences (e.g. to scrap, to change rhythm). As this example suggests, even though other aspects play

a role in political reasoning, metaphors seem to have an important role too in this process, to the extent that the Italian prime minister overtly acknowledges the role that metaphors have had in building his political leadership. Do metaphors really make Renzi's discourses persuasive? And why?

The question about the mechanisms that underlie persuasion, intended as the ability to linguistically affect other people attitudes and beliefs, has intrigued mankind for centuries and has been the subject of intensive research since ancient Greek philosophers started to reflect on language and human society (BRINÕL and PETTY 2012 for a review).

In research on persuasion, metaphors have always had a special role (SOPORY and DILLARD 2002 for a review). In fact, much before Renzi was born, in the IV century before Christ, Aristotle in his *Rhetoric* highlighted the fact that metaphorical language is often more convincing and persuasive than literal talk. And he tried to explain the reason of the communicative effectiveness of metaphors.

Today it is possible to address the issue of the interconnection between metaphor and persuasion in the light of new knowledge coming from neuroscience. Recent neuroscientific findings have been suggesting that our bodily experiences have an important role in language comprehension and, more specifically, also in metaphors understanding. The processing of bodily metaphors (namely, metaphors such as 'to see an idea' or 'to grasp a concept', based on bodily experiences) determines the activation of our sensory and motor systems. It could be possible that bodily-based metaphors increase persuasive effects and, most importantly, that their effectiveness relies exactly on the recruitment of the sensory and motor systems. In this paper these hypotheses will be discussed and characterized under both a theoretical and an empirical point of view.

The question about the specific role of metaphors in persuasion will be addressed here by a novel approach developed across philosophy, social psychology and neuroscience and through the combination of findings from all these disciplines. In the next sections, the state of the art of these disciplines in relation to the topics of metaphor, persuasion and embodiment will be presented. Finally, findings from these different fields will be read in a unified framework to propose some conclusions and new avenues for empirical research.

1. Metaphors and neuroscience

In the last few years many empirical studies, carried out with different techniques (e.g. GLENBER and KASCHAK 2002, GLENBERG et al. 2008, SATO et al. 2008, HAUK, JOHNSRUDE and PULVERMÜLLER 2004, KEMMERER et al. 2008, PULVERMÜLLER 1999, TETTAMANTI et al. 2005, BUCCINO et al. 2005, PAPEO et al. 2009) have shown the involvement of the sensorimotor system in language understanding. This means that listening to a sentence such as 'John grasps the glass' determines the activation of hand-related areas of the motor cortex even if we are not carrying out any hand-related action (for reviews and critical discussions: BARSALOU 2010, FISHER and ZWANN 2008, GLENBERG, WITT, and METCALFE 2013, PULVERMÜLLER et al. 2014, JIRAK et al. 2010). The same holds true also for linguistic descriptions of perception and emotion: in this case, language processing determines the activation of perception or emotion related areas of the brain. With regards to the description of emotions, it has been observed that the processing of verbs that describe facial expressions (e.g. to smile) also

determines the activation of the muscles involved in the real occurrence of those facial expressions (FORONI and SEMIN 2009). The activation of neural circuits in the absence of a corresponding action, perception or emotion has been defined as *Embodied Simulation* (GALLESE and SINIGAGLIA 2011).

The data on the activation of Embodied Simulation during language comprehension suggest that, when language refers to action, emotion and perception, linguistic processing involves the re-activation of our past bodily experiences. This claim holds true even for the comprehension of bodily metaphors, namely metaphors based on our bodily experiences (e.g BOULANGER, HAUK, and PULVERMÜLLER 2009, BOULANGER, SHTYROV, and PULVERMÜLLER 2012, DESAI et al. 2011, DESAI et al. 2013).

Thus, the processing of a metaphorical expression such as 'John grasps the idea' will determine the activation of hand-related areas of the motor cortex as well. It has been suggested that, in this example, we comprehend the abstract concept of 'understanding' (the target domain of the metaphor) resorting to the physical action of 'grasping' (the source domain of the metaphor). In this regard, it is important to note that, while cognitive theories of metaphors have usually described metaphor understanding as a conceptual, abstract and disembodied process that happens at the conceptual level, these recent neuroscientific findings support the claim that our bodies directly contribute to the comprehension of metaphors by means of the mechanism of Embodied Simulation (e.g. GIBBS 2003, GIBBS 2005, MATLOCK, RAMSCAR and BORODITSKY 2005, GIBBS and MATLOCK, 2008, GIBBS and PERLMAN 2010, RITCHIE 2010, SEMINO 2010).

Nevertheless, it is worth noting that divergent findings have also been obtained in another set of studies (e.g. AZIZ-ZADEH et al. 2006, CACCIARI et al. 2011, RAPOSO et al. 2009).

In these studies, the comprehension of figurative and abstract language did not determine the activation of the mechanism of Embodied Simulation. Although it is not easy to make a direct comparison between these researches because they differ in many respects, a meta-analysis study has recently suggested that the involvement of the sensorimotor system in non-literal language comprehension depends on semantic features of language stimuli (YANG and SHU 2015).

More specifically, it has also been suggested that the recruitment of the mechanism of simulation, and hence such variability in findings, depends on the level of conventionality and deliberateness of the metaphors used in the studies. A metaphor is conventional when it is so deeply rooted in our culture that it is no longer considered as a comparison between two different domains (e.g. "the table legs"). The notion of conventionality is partly linked to that of deliberateness. Deliberate metaphors are the only metaphors that give raise to metaphorical mappings and, hence, are the only metaphors that we process as metaphors (STEEN 2011). Deliberateness in metaphor processing depends on the role of attention paid to the source domain of the metaphor in working memory. Only when we pay attention to the source domain a metaphor is deliberate and it is processed as a metaphor. The more conventional and less deliberate is the metaphor, the less motor activation will be observed in the brain. The reason is that when we use a highly conventional metaphor in a not-deliberate way we go directly to the abstract meaning without resorting to the bodily-based source domain. Theoretical (e.g. BOWDLE and GENTNER 2005; CUCCIO and STEEN forthcoming, GENTNER and BOWDLE

2008; GIORA 2003; STEEN 2011) and empirical arguments (e.g TZUYIN LAI and CURRAN 2013) have been provided in support of this claim.

A further crucial problem in this debate is to define the kind of contribution Embodied Simulation makes to linguistic meaning. Currently, this topic is highly debated by philosophers and neuroscientists with different positions being considered (SHAPIRO 2011).

How does the body interact with symbols? Is the contribution of the body really necessary and constitutive of linguistic meaning or is it merely causal, that is causally related to the process of the construction of meaning, but not part of this process? (PULVERMÜLLER 2013). Is it just a side-effect due to other phenomena as has been hypothesized by Mahon and Caramazza (2008)?

This is a crucial theoretical aspect but it is not directly relevant for the topics here discussed. Indeed, independently of the position one holds in this debate, it is still possible to attribute a persuasive role to the body. Embodied Simulation during linguistic processing can affect persuasion both if this mechanism is constitutive of the process of the construction of meaning or if it is just a side effect of language comprehension. This aspect is non influential for the problems here discussed, provided that the mechanism of simulation is triggered by the processing of language.

In this section recent neuroscientific data on the involvement of the body in the comprehension of bodily metaphors have been reviewed. These data show that the comprehension of bodily-related metaphors recruits our bodily experiences. In the next sections I will first focus on the literature on the relationships between metaphors and persuasion and I will, then, address the debate on persuasion and embodiment. In the final section I will put all these findings together in a unified framework. Surprisingly enough, so far, these data have never been approached from a comprehensive perspective.

2. Metaphors and persuasion studies

The interconnection between metaphor and persuasion has been the object of theoretical work and experimental investigation (e.g., BOWERS and OSBORN 1966; FREY and EAGLY 1993; GRAESSER et al. 1989; HITCHON 1997; JOHNSON and TAYLOR 1981; LANDAU, SULLIVAN and GREENBERG 2009; MIO 1996; OTTATI, RHOADS and GRAESSER 1999; READ, CESA, JONES and COLLINS 1990). A review and meta-analytic interpretation of studies on metaphors and persuasion (SOPORY and DILLARD 2002) which is currently the standard reference for this topic confirmed that metaphors increase persuasion. However, other more recent studies (e.g. KRUMDICK et al. 2004; OTTATI and RENSTROM 2010) have also revealed that metaphors could decrease persuasion. There is no contradiction in this apparently diverging set of data. In fact, depending on different factors, metaphors can affect the interlocutor in different ways, increasing or decreasing the persuasiveness of our communication.

It has been suggested, for example, that the persuasiveness of metaphors increases when the interlocutors are somehow familiar with the topic of discussion (JOHNSON and TAYLOR 1981; SOPORY and DILLARD 2002; ROEHM and STERNTHAL 2001) or when the metaphor is semantically linked to the text in which it is embedded (KRUMDICK, OTTATI and DEIGER 2004) or that the persuasiveness of metaphors is dependent on the degree of their conventionality (SEMINO 2010; see also BURGER et al. 2015). In this hypothesis, the more

conventional a metaphor is, the less effective it is (SEMINO 2010; see also BURGER et al. 2015, for a different interpretation). However, different and not always converging explanations for the persuasiveness of metaphor have also been proposed (SOPORY and DILLARD 2002; CHARTERIS-BLACK 2004). Thus, the mechanisms underlying the effectiveness of metaphors are still partly unclear.

Interestingly, while a clear and exhaustive explanation for the persuasiveness of metaphors is not yet available, Aristotle in the IV century b.C. provided an account of the role of metaphors in persuasion that perfectly fits the neuroscientific data presented in the previous section, thus connecting persuasiveness with embodiment. In fact, Aristotle defines as brilliant, that is to say particularly effective, those metaphors which have the characteristic of «putting things in front of the eyes» (Rhet. 1410b). For Aristotle, 'putting things in front of the eyes' is a technical term that indicates the ability to arouse in the receiver of metaphor a mental picture of what it communicates, and what distinguishes the experience of the mental image aroused by the metaphor is that in it «the inanimate becomes animate» (Rhet. 1411b). That is to say, many well-made metaphors describe something inanimate to us in terms of an action. And, according to Aristotle, it is precisely the evocation of an action that determines the communicative effectiveness of metaphors. In other words, metaphors are especially suited, on the one hand, to arousing our mental imagination. They arouse in our mind particularly vivid mental images of what they communicate. On the other hand, some of the metaphors we use are particularly suited to describing even something inanimate as a living and acting being. It is precisely this latter characteristic, the evocation of an action carried out by a living being, that greatly determines the communicative effectiveness of metaphors. Metaphors allow us to get a deeper understanding of the topic of discussion because often they exploit our own bodily experiences, that is, they use something very familiar to us to allow us to comprehend abstract and difficult concepts. In this line of thought, even abstract topics related, for example, to political issues, to go back to the example of the Italian prime minister, can be communicated by referring to possible physical actions and to other bodily experiences.

These aspects clearly evoke the neural mechanism that neuroscientists today define as Embodied Simulation. It is easy to suggest that the persuasiveness of those metaphors that *put things in front of the eyes* is due to the exploitation of our own bodily experiences through the mechanism of Embodied Simulation. However, while other aspects of the Aristotelian theory of metaphor have already been taken into account in recent studies on metaphors and persuasion (see SOPORY and DILLARD 2002), so far the hypothesis that persuasive metaphors exploit the mechanism of Embodied Simulation has never been directly addressed in the debate on metaphors and persuasion.

3. Persuasion, simulation and embodiment

The hypothesis has been theoretically proposed and empirically investigated that persuasive effects are increased by elements that enhance imaginative simulation (e.g. GERRIG 1993; STRANGE and LEUNG 1999; GREEN and BROCK 2000; GREEN and BROCK 2002, GREEN 2004; GIBBS 2006; RITCHIE 2010; MOYER-GUSÉ 2008, RITCHIE 2008).

Imaginative simulation here means the possibility to imagine a fictive world, to transform in mental pictures what we read or listen to, to become protagonist of these pictures and to travel through them. To the extent that people are absorbed into a

story and transported into a narrative world, this transportation into/simulation of a fictive reality can have effects on their real-life beliefs. In other words, it has been shown that the recruitment of this transportation/simulation mental process, as it has been here defined, greatly increases persuasiveness. When we come back from our mental journey into the story, our beliefs and mood can be changed as an effect of the fictive experiences.

The mental process that leads us to travel into a text (GERRIG 1993) and mentally simulate it (GIBBS 2006) can be clearly put in relation to neuroscientific findings on the mechanism of Embodied Simulation (WOJCIEHOWSKI and GALLESE 2011). When we imagine having the experiences of the characters of a story, areas of the brain that control actions, emotions and perception related to those experiences will be activated as if we were really having those experiences.

Surprisingly, however, so far the connection between persuasion and the neural mechanism of Embodied Simulation has not been directly investigated. Instead, the relationship between persuasion and bodily experiences has been investigated from another perspective. It has been shown that our bodily responses (e.g. heart beating), body postures (e.g. standing) and movements (e.g. approaching or avoiding movements) significantly influence persuasion (for a review, BRINÕL and PETTY 2008).

For example, the physical posture of the interlocutor can affect the extent of the message processing and, as a consequence, his/her susceptibility to persuasion (BRINÕL and PETTY 2008). As another example, it has also been observed that facial expressions can have persuasive effects. In a widely replicated study, Strack, Martin and Stepper (1988) showed that a facial expression similar to smiling, induced in the participants in the study by holding a pen between their teeth while they were watching cartoons significantly increased positive judgments towards the cartoons compared to the judgments of participants with induced frowning facial expressions (STRACK, MARTIN, and STEPPER 1988, ZAJONC, MURPHY, and INGLEHART 1989). These and many other studies have shown that our bodies, in many ways, actively influence persuasive effects (see BRINÕL and PETTY 2008 for an overview). But, what does this mean and how can these data help us to understand the mechanism of persuasion?

4. Towards a conclusion

The findings reviewed before suggest several important points. Firstly, neuroscientific data show that the processing of bodily metaphors engages the sensorimotor system. Secondly, psychological research show that metaphors contribute to the persuasiveness of a text and are very often used by politicians, advertisers and mass media people. Thirdly, studies in social psychology have shown that persuasiveness is enhanced by mental imagination and by the process of being transported into a story. Fourthly, it has also been shown that the physical body can affect persuasion. Our postures or facial expression have a role in how we perceive persuasive messages.

These last data on the role of the body in affecting persuasion are extremely interesting. However, it is clear that when we want to understand what makes a discourse persuasive we cannot look at these data. In fact, postures or facial expressions of the interlocutors are not variables a speaker can control. Still, these data about the role of the body in affecting attitudes, considered in the light of theories and experimental evidence on the mechanism of transportation/travel into a

text and of the neuroscientific findings on the mechanism of Embodied Simulation, suggest that there is something that has to do with our physical experiences that influences persuasion. And, clearly, the persuasive power of our bodily experiences has to be already present in the linguistic text (in fact, persuasion has been defined as the ability to *linguistically* affect other people attitudes and beliefs). But what is this power and how it works?

The data reviewed suggest that language can be so powerful as to allow us to manipulate even a variable, the body of our interlocutors, that apparently we could not control. Most importantly, by means of metaphorical expressions these persuasive effects are not limited to the linguistic descriptions of topics directly related to action and perception. These effects can be extended also to the discussion of abstract topics such as, for example, the political line-guides of a country. It is now important to explain how this can happen.

Recently, Foroni and Semin (2010) showed that linguistic descriptions of positive and negative facial expressions (e.g. the verbs 'to smile, 'to frown' etc…) activate the same facial muscles as are involved in the real occurrence of these facial expressions and that this activation, induced by language processing, affects judgments of the participants in their study analogously to the effect found by Strack, Martin, and Stepper (1988). In the light of Foroni and Semin's data, it is very likely that metaphorical usages of verbs describing facial expressions (e.g. "smiling at life") also activate the same facial muscles as are involved in the real occurrence of these facial expressions and that this activation, induced by the processing of metaphors, affects judgments as well. In the same vein, by means of the mechanism of Embodied Simulation language can recruit our physical body in such a way to make it more or less receptive to persuasive messages, as studies on persuasion and embodiment have shown (BRINÕL and PETTY 2008). In this hypothesis, bodily-related metaphors could have persuasive effects thanks to their potentiality to actively recruit our bodies and to manipulate our bodily attitudes. In fact, on the one hand, the relation to our bodily experiences makes metaphors particularly clear and, thus, easily accessible. On the other hand, bodily-related metaphors directly affects our physical body by means of the mechanism of Embodied Simulation. This mechanism can be exploited to put our interlocutor in a specific bodily state which can, then, influence his/her attitude towards a persuasive message.

This conclusion needs to be further supported by empirical data. Experimental research specifically aimed to investigate the interaction between metaphor, persuasion and embodiment is the next step in the agenda. We need to discover whether and describe how bodily experiences, elicited by bodily-based metaphors, can influence persuasion and to determine how the bodily dimension of metaphor processing interacts with the symbolic system during persuasive communication.

New avenues of research are open to be explored and this research is crucial for our society. A better understanding of the mechanisms responsible for the communicative effectiveness of metaphors will certainly lead to a deeper understanding of the mechanisms of persuasion. To achieve this goal is of paramount importance. The question about the mechanisms of persuasion is today even more compelling considering the extraordinary potentiality of the mass media: communication today has in principle no limits. The power of communication today has in principle no limits and it influences our life, from everyday choices to political orientations.

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